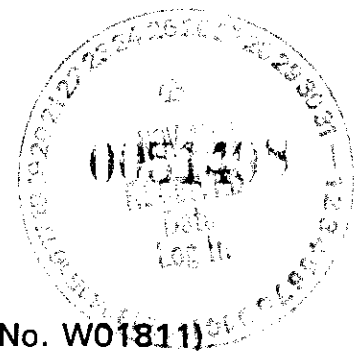


Date: 25 November 1998
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 107-D1Trench - Confirmation
Subject: Inorganics - Data Package No. W01811-QES (SDG No. W01811)



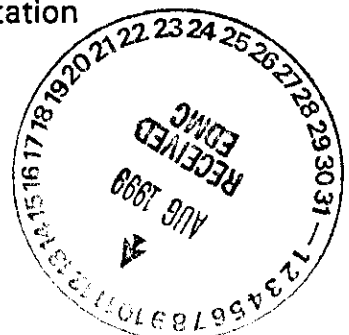
INTRODUCTION

This memo presents the results of data validation on Data Package No. W01811-QES prepared by Quanterra Environmental Services (QES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOKOF4	7/29/97	Soil	C	Lead (7421); Chrome VI (7196)
BOKOF5	7/29/97	Soil	C	Lead (7421); Chrome VI (7196)
BOKOF6	7/29/97	Soil	C	Lead (7421); Chrome VI (7196)
BOKOF7	7/29/97	Soil	C	Lead (7421); Chrome VI (7196)
BOKOF8	7/29/97	Soil	C	Lead (7421); Chrome VI (7196)
BOKOH0	7/29/97	Soil	C	Lead (7421); Chrome VI (7196)
BOKOH1	7/29/97	Soil	C	Lead (7421); Chrome VI (7196)

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation



000001

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding time for lead were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Solid samples must be analyzed within six (6) months for lead and 30 days for chromium VI.

All holding times were acceptable.

- **Blanks**

Preparation Blanks

At least one preparation blank, processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field and Equipment Blanks

One equipment blank (BOKOH1) and one field blank (BOKOH0) were submitted for analysis. Lead was detected in both the field and the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ".

All laboratory duplicate recovery results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOK0F7/BOK0F8) were submitted to QES for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. The RPD for lead was outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the requirements on

page II-5 of the 100 Area Remedial Action Sampling and Analysis Plan to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific CRDL.

- **Completeness**

Data package No. W01811-QES (SDG No. W01811) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found, although lead was detected in both the field and equipment blank and the field duplicate results for lead were outside QC limits.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

Appendix 1
Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W01811	REVIEWER: TLI	DATE: 11/25/98	PAGE <u>1</u> OF <u>1</u>
COMMENTS: None assigned.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

[illegible]

000010

Lab Name: QUANTERRA MO	Contract: 550.234	SDG No.: W01811
Lab Code: ITMO	Case No.:	SDG No.: W01811
Matrix (soil/water): SOIL	SAS No.:	Lab Sample ID: 15452-001
Level (low/med): LOW		Date Received: 07/29/97
% Solids: 99.4		

Concentration Units (ug/L or mg/kg dry weight): MG/KG

[illegible]

Rec
11/25/78

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

omments:

FORM I - IN

SW-846

~~000045~~

000011

BOKOF8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

[illegible]

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

SW-846

000015

1
INORGANIC ANALYSES DATA SHEET

ВОКОНО

Concentration Units (ug/L or mg/kg dry weight): MG/KG

[illegible]

Comments:

SW-846

000016

~~000030~~

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ВОКОН1

Lab Name: QUANTERRA MO	Contract: 550.234	SDG No.: W01811
Lab Code: ITMO Case No.:	SAS No.:	Lab Sample ID: 15452-007
Matrix (soil/water): SOIL		Date Received: 07/29/97
Level (low/med): LOW		
% Solids: 99.7		

Concentration Units (ug/L or mg/kg dry weight): MG/KG

[illegible]

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM 7 - IN

SW-846

11/25/98

~~000051~~

000017

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740801 MATRIX: SOIL
CLIENT ID: B0K0F4 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	6.21E-03	1.6E-02	1.7E-02	4.07E-02	pCi/g	37.40%	RICHRC5010
PU239/40	7.51E-03	1.6E-02	1.6E-02	3.28E-02	pCi/g	37.40%	RICHRC5010
AM-241	3.20E-02	3.4E-02	3.4E-02	5.63E-02	pCi/g	N/A	RICHRC5017
CO-60	1.94E-02	8.3E-03	8.5E-03	1.63E-02	pCi/g	N/A	RICHRC5017
CS-137DA	4.79E-02	2.0E-02	2.1E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	5.21E-02	2.2E-02	2.3E-02	3.89E-02	pCi/g	N/A	RICHRC5017
EU-154	1.27E-03	2.8E-02	2.8E-02	4.83E-02	pCi/g	N/A	RICHRC5017
EU-155	1.92E-02	2.6E-02	2.6E-02	4.08E-02	pCi/g	N/A	RICHRC5017
K-40	1.02E+01	4.0E-01	1.1E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.25E-01	2.5E-02	5.8E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	4.06E-01	3.2E-02	5.2E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	5.02E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.63E-01	2.9E-01	3.0E-01	4.92E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	7.22E-02	3.7E-02	4.6E-02	1.13E-01	pCi/g	92.20%	RICHRC5006

Number of Results: 15

Handwritten signature
11/25/98

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740802 MATRIX: SOIL
CLIENT ID: B0K0F5 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	6.77E-03	1.7E-02	1.7E-02	4.53E-02	pCi/g	37.40%	RICHRC5010
PU239/40	2.48E-02	2.9E-02	3.0E-02	3.41E-02	pCi/g	37.40%	RICHRC5010
AM-241	-1.48E-02	3.2E-02	3.2E-02	5.15E-02	pCi/g	N/A	RICHRC5017
CO-60	6.21E-03	9.6E-03	9.6E-03	1.70E-02	pCi/g	N/A	RICHRC5017
CS-137DA	9.25E-03	8.4E-03	8.5E-03	1.47E-02	pCi/g	N/A	RICHRC5017
EU-152	1.61E-02	2.0E-02	2.0E-02	3.49E-02	pCi/g	N/A	RICHRC5017
EU-154	-8.57E-03	3.1E-02	3.1E-02	5.07E-02	pCi/g	N/A	RICHRC5017
EU-155	3.90E-02	2.5E-02	2.6E-02	4.12E-02	pCi/g	N/A	RICHRC5017
K-40	1.13E+01	4.4E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	6.21E-01	2.8E-02	6.8E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	4.78E-01	3.7E-02	6.0E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	6.57E-01	6.8E-02	9.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	1.74E-01	3.4E-01	3.4E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	4.79E-02	3.5E-02	3.9E-02	1.17E-01	pCi/g	90.90%	RICHRC5006

Number of Results: 15

11/25/98
PZ

0000

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740803 MATRIX: SOIL
CLIENT ID: BOK0F6 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	7.76E-04	1.6E-03	1.6E-03	3.00E-02	pCi/g	43.40%	RICHRC5010
PU239/40	6.60E-03	2.0E-02	2.0E-02	5.18E-02	pCi/g	43.40%	RICHRC5010
AM-241	3.89E-03	4.6E-02	4.7E-02	7.75E-02	pCi/g	N/A	RICHRC5017
CO-60	-2.23E-03	8.8E-03	8.8E-03	1.46E-02	pCi/g	N/A	RICHRC5017
CS-137DA	2.90E-02	1.2E-02	1.2E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	4.58E-02	2.0E-02	2.0E-02	3.56E-02	pCi/g	N/A	RICHRC5017
EU-154	2.21E-02	2.5E-02	2.5E-02	4.48E-02	pCi/g	N/A	RICHRC5017
EU-155	3.10E-02	2.3E-02	2.4E-02	3.90E-02	pCi/g	N/A	RICHRC5017
K-40	9.34E+00	3.7E-01	1.0E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	4.77E-01	2.3E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	3.91E-01	3.2E-02	5.1E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	5.06E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	5.23E-01	5.1E-01	5.1E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	4.63E-02	3.6E-02	3.9E-02	1.20E-01	pCi/g	84.40%	RICHRC5016

Number of Results: 15

pl
11/25/98

000020

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740804 MATRIX: SOIL
CLIENT ID: B0K0F7 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	9.05E-04	1.8E-03	1.8E-03	4.55E-02	pCi/g	35.50%	RICHRC5010
PU239/40	3.21E-02	3.9E-02	4.0E-02	5.16E-02	pCi/g	35.50%	RICHRC5010
AM-241	5.90E-02	3.4E-02	3.4E-02	5.58E-02	pCi/g	N/A	RICHRC5017
CO-60	3.34E-02	1.1E-02	1.1E-02	2.17E-02	pCi/g	N/A	RICHRC5017
CS-137DA	2.01E-01	1.8E-02	2.7E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	3.74E-01	4.5E-02	5.9E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	4.51E-02	3.2E-02	3.2E-02	5.67E-02	pCi/g	N/A	RICHRC5017
EU-155	3.96E-02	2.7E-02	2.8E-02	4.42E-02	pCi/g	N/A	RICHRC5017
K-40	1.07E+01	4.2E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.57E-01	2.0E-02	6.3E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	4.65E-01	3.9E-02	6.1E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	5.71E-01	7.5E-02	9.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	8.40E-01	4.1E-01	4.2E-01	N/A	pCi/g	N/A	RICHRC5017
STRONTIUM	2.37E-01	5.9E-02	1.0E-01	1.41E-01	pCi/g	90.10%	RICHRC5006

Number of Results: 15

new
10/25/98

000009

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740805 MATRIX: SOIL
CLIENT ID: B0K0F8 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	1.22E-03	1.7E-03	1.7E-03	3.48E-02	pCi/g	40.80%	RICHRC5010
PU239/40	3.51E-02	3.4E-02	3.5E-02	4.31E-02	pCi/g	40.80%	RICHRC5010
AM-241	5.40E-03	3.6E-02	3.6E-02	5.66E-02	pCi/g	N/A	RICHRC5017
CO-60	3.02E-02	1.1E-02	1.1E-02	2.10E-02	pCi/g	N/A	RICHRC5017
CS-137DA	1.74E-01	1.6E-02	2.4E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	3.32E-01	4.2E-02	5.4E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	7.62E-03	3.1E-02	3.1E-02	5.28E-02	pCi/g	N/A	RICHRC5017
EU-155	3.18E-02	2.5E-02	2.5E-02	4.17E-02	pCi/g	N/A	RICHRC5017
K-40	9.80E+00	3.9E-01	1.1E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.11E-01	2.6E-02	5.7E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	3.98E-01	3.6E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	5.15E-01	7.1E-02	8.8E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.26E-01	3.0E-01	3.1E-01	4.99E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	3.04E-01	6.1E-02	1.2E-01	1.15E-01	pCi/g	93.70%	RICHRC5006

Number of Results: 15

pu
11/25/98

00020

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740806 MATRIX: SOIL
CLIENT ID: BOK0H0 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	0.00E+00	0.0E+00	3.2E-02	2.88E-02	pCi/g	28.00%	RICHRC5010
PU239/40	-8.51E-04	1.7E-03	1.7E-03	4.28E-02	pCi/g	28.00%	RICHRC5010
AM-241	-1.38E-02	2.9E-02	2.9E-02	4.54E-02	pCi/g	N/A	RICHRC5017
CO-60	9.53E-03	8.0E-03	8.1E-03	1.50E-02	pCi/g	N/A	RICHRC5017
CS-137DA	4.61E-03	6.6E-03	6.6E-03	1.11E-02	pCi/g	N/A	RICHRC5017
EU-152	8.22E-03	1.7E-02	1.7E-02	2.86E-02	pCi/g	N/A	RICHRC5017
EU-154	-1.25E-03	3.3E-02	3.3E-02	5.51E-02	pCi/g	N/A	RICHRC5017
EU-155	2.38E-02	1.9E-02	1.9E-02	3.30E-02	pCi/g	N/A	RICHRC5017
K-40	1.61E+01	4.7E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	2.26E-01	1.8E-02	2.9E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	1.98E-01	3.0E-02	3.6E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	2.03E-01	5.2E-02	5.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	1.14E-01	2.5E-01	2.5E-01	4.00E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	2.66E-02	3.1E-02	3.2E-02	1.15E-01	pCi/g	90.10%	RICHRC5006

Number of Results: 15

per
11/25/98

00014

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland **SDG: /RPT GRP:** W01811 / 3274
LAB SAMPLE ID: 70740807 **MATRIX:** SOIL
CLIENT ID: B0K0H1 **DATE RECEIVED:** 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	3.47E-03	9.2E-03	9.2E-03	2.28E-02	pCi/g	66.90%	RICHRC5010
PU239/40	-3.65E-04	7.3E-04	7.3E-04	1.84E-02	pCi/g	66.90%	RICHRC5010
AM-241	2.70E-03	3.4E-02	3.4E-02	5.43E-02	pCi/g	N/A	RICHRC5017
CO-60	1.89E-02	8.5E-03	8.7E-03	1.64E-02	pCi/g	N/A	RICHRC5017
CS-137DA	-2.14E-03	6.6E-03	6.6E-03	1.11E-02	pCi/g	N/A	RICHRC5017
EU-152	1.18E-02	1.7E-02	1.7E-02	2.93E-02	pCi/g	N/A	RICHRC5017
EU-154	-4.45E-02	3.2E-02	3.3E-02	5.06E-02	pCi/g	N/A	RICHRC5017
EU-155	-3.43E-03	2.1E-02	2.1E-02	3.33E-02	pCi/g	N/A	RICHRC5017
K-40	1.63E+01	4.6E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	2.08E-01	2.4E-02	3.2E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	2.03E-01	2.8E-02	3.5E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	2.45E-01	4.0E-02	4.7E-02	7.99E-02	pCi/g	N/A	RICHRC5017
U-238	1.90E-01	2.7E-01	2.7E-01	4.46E-01	pCi/g	N/A	RICHRC5017
STRONTIUM	1.57E-02	3.4E-02	3.5E-02	1.37E-01	pCi/g	94.20%	RICHRC5006

Number of Results: 15

per
11/25/98

00012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

August 20, 1997

Attention: Joan Kessner

SAF Number	:	B97-091
Date SDG Closed	:	July 29, 1997
Number of Samples	:	Seven (7)
Sample Type	:	Soil
SDG Number	:	W01811
Data Deliverable	:	Summary



I. Introduction

On July 29, 1997, seven soil samples were received by the Quanterra Environmental Services Richland Laboratory (QESRL) for radiochemical and chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>QESRL ID#</u>	<u>BHI ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
70740801	B0K0F4	Soil	7/29/97
70740802	B0K0F5	Soil	7/29/97
70740803	B0K0F6	Soil	7/29/97
70740804	B0K0F7	Soil	7/29/97
70740805	B0K0F8	Soil	7/29/97
70740806	B0K0H0	Soil	7/29/97
70740807	B0K0H1	Soil	7/29/97

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

Bechtel Hanford, Inc.
August 20, 1997
Page 2

The requested analyses were:

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

Chemical Analyses

Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W01811 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results with the exception of the chemical analyses which are reported in mg/L.

IV. Comments

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010

Due to an oversight samples from SDGs W01809 and W01811 were batched together. The LCS, batch blank, sample and sample duplicate (B0K0N4) results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.

Bechtel Hanford, Inc.
August 20, 1997
Page 3

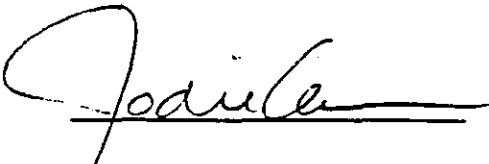
Chemical Analysis

Chromium Hex by EPA method 7196

The original analysis of the samples was performed within the holding time. However, due to problems with the blank, the sample were reanalyzed outside holding time as per client direction. The matrix spike and matrix spike duplicate recoveries were low due to sample matrix interference. A post digestive spike was analyzed and its low recovery confirms the reducing effect of the sample. The LCS, batch blank, sample results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Jodie Carnes
Project Manager

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

August 15, 1997

Attention: Joan Kessner



Project number	:	550.234
Date Received by Lab	:	July 29, 1997
Number of Samples	:	Seven (7)
Sample Type	:	Soil
SDG Number	:	W01811
Data Deliverable	:	Summary

I. Introduction

On July 29, 1997, seven (7) soil samples were received by Quanterra, Richland and were transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client IDs:

<u>St. Louis ID</u>	<u>BHI ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
15452-001	BOK0F4	70740701	Soil	29-JUL-97
15452-002	BOK0F5	70740702	Soil	29-JUL-97
15452-003	BOK0F6	70740703	Soil	29-JUL-97
15452-004	BOK0F7	70740704	Soil	29-JUL-97
15452-005	BOK0F8	70740705	Soil	29-JUL-97
15452-006	BOK0H0	70740706	Soil	29-JUL-97
15452-007	BOK0H1	70740707	Soil	29-JUL-97

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: Pesticides and PCBs by EPA Method 8080. Lead by EPA Method 7421.

000029

Bechtel Hanford Incorporated
August 15, 1997
Project Number: 550.234
SDG: W01811
Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate were performed per the protocol for each analyte in this SDG.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Shipping and Receiving

There were no variances associated with sample receipt.

Pesticides/PCBs

The samples were determined to be near 100% solids, therefore, the moisture correction is negligible.

Some of the compounds for each sample in this sample delivery group are reported at a higher detection limit due to PCB interference. The results are flagged with an 'X' qualifier.

Metals

The matrix spike recovery for lead in sample 15452-001 was 77.5%, the matrix spike duplicate recovery 92.8%. In accordance with our standard operating procedure the associated lead data was flagged with an "N".

000030

~~000003~~

Bechtel Hanford Incorporated

August 15, 1997

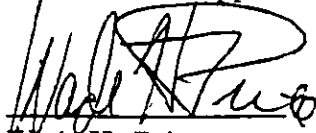
Project Number: 550.234

SDG: W01811

Page 3

I certify that this Certificate of Analysis in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Wade H. Price

Project Manager

e:\price\$\hanford\550\20x\hanw1811.coa

000031

000003A

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B97-091-16

Page 1 of 1

Collector <i>Doug Bryant</i>	Company Contact Duane Jacques	Telephone No. 372-9400	Project Coordinator Koerner, CC	Data Turnaround 15 Days						
Project Designation 107-D-1 Trench - Confirmation	Sampling Location 100-DR-1	SAF No. B97-091								
Ice Chest No.	Field Logbook No. <i>ELC-1301</i>	Method of Shipment Hand deliver								
Shipped To Quanterra	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>								
POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	Cool 4C	None	None	Cool 4C	None			
	Type of Container	G/P	G	G	G	G	G	<i>SP</i>		
	No. of Container(s)	1	1	1	1	1	1	1		
Special Handling and/or Storage Cool to 4C	Volume	20ml	60ml	60ml	60ml	60ml	120ml	1000ml		

SAMPLE ANALYSIS

*107407**SDX*
W01811

Activity Scan	Chromium Hex - 7196	Isotopic Plutonium	Lead - 7421- (GFAA)	Strontium- 89,90 - Total Sr	Pest/PCBs - 8080 (TCL)	See item (1) in Special Instructions.
	<i>107408</i>			<i>107408</i>		<i>107408</i>

Sample No.	Matrix *	Sample Date	Sample Time										
BOKOF <i>C</i> 01	Soil	7-29-97	0825	X	X	X	X	X	X	X			
BOKOF <i>S</i> 02	Soil	7-29-97	0840	X	X	X	X	X	X	X			
BOKOF <i>E</i> 03	Soil	7-29-97	0855	X	X	X	X	X	X	X			
BOKOF <i>W</i> 04	Soil	7-29-97	1005	X	X	X	X	X	X	X			
BOKOF 05	Soil	7-29-97	1010	X	X	X	X	X	X	X			

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By <i>Doug Bryant</i>	Date/Time <i>7-29-97 1135</i>	Received By <i>Duane Jacques</i>	Date/Time <i>7/29/97 1135</i>
Relinquished By	Date/Time	Received By <i>KLCCP</i>	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155);
Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- T - Tissue
- WI - Wipe
- L - Liquid
- V - Vegetation
- X - Other

LABORATORY SECTION

Received By

Title

Date/Time

FINAL SAMPLE DISPOSITION

Disposal Method

Disposed By

Date/Time

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B97-091-17

Page 1 of 1

Collector <i>Doug Bryant</i>	Company Contact Duane Jacques	Telephone No. 372-9400	Project Coordinator Koerner, CC	Data Turnaround 15 Days						
Project Designation 107-D-1 Trench - Confirmation	Sampling Location 100-DR-1	SAF No. B97-091								
Ice Chest No.	Field Logbook No. <i>EL-1301</i>	Method of Shipment Hand deliver								
Shipped To Quanterra	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>								
POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	Cool 4C	None	None	Cool 4C	None			
	Type of Container	G/P	G	G	G	gG	<i>8 P 2</i>			
	No. of Container(s)	1	1	1	1	1	1			
Special Handling and/or Storage Cool to 4C	Volume	20ml	60ml	60ml	60ml	60ml	120ml	1000ml		

SAMPLE ANALYSIS

107407

Activity Scan	Chromium Hex - 7196	Isotopic Plutonium	Lead - 7421 - (GFAA)	Strontium- 89,90 - Total Sr	Pest/PCBs - 8080 (TCL)	See item (I) in Special Instructions.
	<i>107408</i>			<i>107408</i>		<i>107408</i>

Sample No.	Matrix *	Sample Date	Sample Time										
BOKOH0 <i>06</i>	Soil	<i>7-29-97</i>	<i>0915</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>x</i>	<i>x</i>	<i>x</i>			
BOKOH1 <i>07</i>	Soil	<i>7-29-97</i>	<i>0925</i>	<i>x</i>	<i>x</i>	<i>x</i>	<i>L</i>	<i>x</i>	<i>x</i>	<i>x</i>			
BOKOH2	Soil <i>2.2</i>												

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By <i>Doug Bryant</i>	Date/Time <i>7-29-97</i>	Received By <i>[Signature]</i>	Date/Time <i>7/29/97 1135</i>
Relinquished By	Date/Time	Received By <i>[Signature]</i>	Date/Time <i>7/29/97 1135</i>
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155);
Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- T - Tissue
- WI - Wipe
- L - Liquid
- V - Vegetation
- X - Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 107-D1 trench	DATA PACKAGE: W01811				
VALIDATOR: TLI	LAB: AFS		DATE: 11/23/98		
CASE:	SDG: W01811				
ANALYSES PERFORMED					
<input type="checkbox"/> CLP/ICP	<input type="checkbox"/> CLP/GFAA	<input type="checkbox"/> CLP/Hg	<input type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> SW-846/ICP	<input checked="" type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	Filter chrome	<input type="checkbox"/>
SAMPLES/MATRIX Soil					
BOKOF4, BOKOF5, BOKOF6, BOKOF7, BOKOF8					
BOKOHO BOKOH1					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No ☒Is a case narrative present? ☒ Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? ☒ Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments?	Yes	No	N/A
Are initial calibrations acceptable?	Yes	No	N/A
Are ICP interference checks acceptable?	Yes	No	N/A
Were ICV and CCV checks performed on all instruments?	Yes	No	N/A
Are ICV and CCV checks acceptable?	Yes	No	N/A

Comments: _____

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses?	Yes	No	N/A
Are ICB and CCB results acceptable?	Yes	No	N/A
Were preparation blanks analyzed?	Yes	No	N/A
Are preparation blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments: H0 + 1+1 both have lead detected

5. ACCURACY

Were spike samples analyzed?	Yes	No	N/A
Are spike sample recoveries acceptable?	Yes	No	N/A
Were laboratory control samples (LCS) analyzed?	Yes	No	N/A
Are LCS recoveries acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed?	<u>Yes</u>	No	N/A
Are laboratory duplicate samples RPD values acceptable?	<u>Yes</u>	No	N/A
Were ICP serial dilution samples analyzed?	Yes	No	<u>N/A</u>
Are ICP serial dilution %D values acceptable?	Yes	No	<u>N/A</u>
Are field duplicate RPD values acceptable?	Yes	<u>No</u>	N/A
Are field split RPD values acceptable?	Yes	No	<u>N/A</u>

Comments: RPD outside of limit (lead)

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required?	Yes	No	<u>N/A</u>
Are duplicate injection %RSD values acceptable?	Yes	No	<u>N/A</u>
Were analytical spikes performed as required?	Yes	No	<u>N/A</u>
Are analytical spike recoveries acceptable?	Yes	No	<u>N/A</u>
Was MSA performed as required?	Yes	No	<u>N/A</u>
Are MSA results acceptable?	Yes	No	<u>N/A</u>

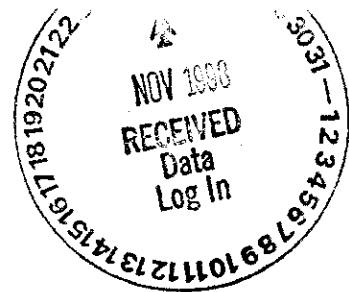
Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses?	<u>Yes</u>	No	N/A
Are all results supported in the raw data?	Yes	No	<u>N/A</u>
Are results calculated properly?	Yes	No	<u>N/A</u>
Do results meet the CRDLs?	Yes	No	N/A

Comments: _____

Date: 25 November 1998
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 107-D1 Trench - Confirmation
Subject: Pesticide/PCB - Data Package No. W01811-QES (SDG No. W01811)



INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. W01811-QES prepared by Quanterra Environmental Services (QES). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOKOF4	7/29/97	Soil	C	Pest/PCBs by EPA 8080
BOKOF5	7/29/97	Soil	C	Pest/PCBs by EPA 8080
BOKOF6	7/29/97	Soil	C	Pest/PCBs by EPA 8080
BOKOF7	7/29/97	Soil	C	Pest/PCBs by EPA 8080
BOKOF8	7/29/97	Soil	C	Pest/PCBs by EPA 8080
BOKOH0	7/29/97	Soil	C	Pest/PCBs by EPA 8080
BOKOH1	7/29/97	Soil	C	Pest/PCBs by EPA 8080

Data validation was conducted in accordance with the BHI validation statement of work (BHI 1997) and the 100 Area Remedial Action Sampling and Analysis Plan (May 1998). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

000001

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than the CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as nondetects and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as a nondetect, elevated to the CRQL and flagged "U".

All method blank target compound results were acceptable.

Field and Equipment Blanks

One equipment blank (BOKOH1) and one field blank (BOKOH0) were submitted for analysis. No analytes were detected in the field or equipment blank.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate

analyses are performed in duplicate using six compounds and must be within the established laboratory quality control limits of 70-130 percent. If spike recoveries are outside control limits, detected sample results less than 5 times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate recovery results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Undetected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to the lack of a DCB surrogate analysis, all results in samples BOKOF6, BOKOF7, BOKOF8, BOKOHO and BOKOH1 were qualified as estimates and flagged "J".

All other surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Results must be within RPD limits of $\pm 30\%$ for soil samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples were submitted to QES for analysis as shown below:

<u>Sample No.</u>	<u>Duplicate Sample No.</u>
BOKOF7	BOKOF8

The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. The RPD for 4',4-DDT was outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Detection Levels**

Reported laboratory detection levels are compared against the target detection limits (TDLs) specified on page II-5 of the 100 Area Remedial Action Sampling and Analysis Plan to ensure that laboratory detection levels meet the required criteria. The reported analytical detection level were above the TDL for the following: toxaphene was above in all samples; endrin, endrosulfan II, 4,4'-DDD, endosulfan sulfate, 4,4'-DDT, methoxychlor, and endrin aldehyd were above in sample BOKOF5; arochlor-1242 was above in samples BOKOF5, BOKOF6, BOKOF7, and BOKOF8; arochlor-1254 in sample BOKOF5; and arochlor-1260 in samples BOKOF5, BOKOF6, BOKOF7 and BOKOF8. Under the BHI statement of work, no qualification is required. All other reported detection levels were at or below the TDL.

- **Completeness**

Data Package No. W01811-QES (SDG No.W01811) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a DCB surrogate analysis, all results in samples BOKOF6, BOKOF7, BOKOF8, BOKOHO and BOKOH1 were qualified as estimates and flagged

"J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W01811	REVIEWER: TLI	DATE: 11/25/98	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	BOKOF6, BOKOF7, BOKOF8, BOKOH0, BONOH1	No DCB surrogate analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000011

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA, MO Contract: 550-234 BOKOF5

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01811

Matrix: (soil/water) SOIL Lab Sample ID: 15452-002

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 07-29-97

% Moisture: not dec. 1 dec. _____ Date Extracted: 08-01-97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO. Compound (ug/L or ug/Kg) UG/KG Q

319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	5.1	UX
309-00-2	Aldrin	7.0	UX
1024-57-3	Heptachlor epoxide	3.2	UX
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	4.7	UX
72-55-9	4,4'-DDE	3.7	UX
72-20-8	Endrin	340	UX*
33213-65-9	Endosulfan II	170	U*
72-54-8	4,4'-DDD	170	U*
1031-07-8	Endosulfan sulfate	170	U*
50-29-3	4,4'-DDT	1000	UX*
72-43-5	Methoxychlor	590	UX*
53494-70-5	Endrin Aldehyde	720	UX*
57-74-9	Tech. Chlordane	17	U
8001-35-2	Toxaphene	67	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	130	**
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	3300	U*
11096-82-5	Aroclor-1260	47000	*

X: Elevated detection limit due to PCB interference.
 *: Reported from a 100X dilution on 08-14-97.
 **: Reported from a straight run on 08-14-97.
 U: Concentration of analyte is less than the value given.

FORM I PEST

1/87 Rev.

000012

per
11/25/95
000032

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA, MO Contract: 550-234 BOKOF4

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01811

Matrix: (soil/water) SOIL Lab Sample ID: 15452-001

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 07-29-97

% Moisture: not dec. 0 dec. _____ Date Extracted: 08-01-97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

Compound

Q

319-84-6-----	alpha-BHC	1.7	U
319-85-7-----	beta-BHC	1.7	U
319-86-8-----	delta-BHC	1.7	U
58-89-9-----	gamma-BHC (Lindane)	1.7	U
76-44-8-----	Heptachlor	1.7	U
309-00-2-----	Aldrin	1.7	U
1024-57-3-----	Heptachlor epoxide	1.7	U
959-98-8-----	Endosulfan I	1.7	U
60-57-1-----	Dieldrin	1.7	U
72-55-9-----	4,4'-DDE	1.7	U
72-20-8-----	Endrin	1.7	U
33213-65-9-----	Endosulfan II	1.7	U
72-54-8-----	4,4'-DDD	1.7	U
1031-07-8-----	Endosulfan sulfate	1.7	U
50-29-3-----	4,4'-DDT	1.7	U
72-43-5-----	Methoxychlor	3.3	U
53494-70-5-----	Endrin Aldehyde	1.7	U
57-74-9-----	Tech. Chlordane	17	U
8001-35-2-----	Toxaphene	67	U
11104-28-2-----	Aroclor-1221	33	U
11141-28-2-----	Aroclor-1232	33	U
53469-21-9-----	Aroclor-1242	33	U
12674-11-2-----	Aroclor-1016	33	U
12672-29-6-----	Aroclor-1248	33	U
11097-57-4-----	Aroclor-1254	33	U
11096-82-5-----	Aroclor-1260	33	U

U: Concentration of analyte is less than the value given.

FORM I PEST

1/87 Rev.

pc
11/25/97

~~000028~~

000013

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOK0F6

Lab Name: QUANTERRA,MO Contract: 550-234

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01811

Matrix: (soil/water) SOIL Lab Sample ID: 15452-003

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 07-29-97

% Moisture: not dec. 0 dec. _____ Date Extracted: 08-01-97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. Compound CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	2.3	UX
309-00-2	Aldrin	2.6	UX
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	13	UX
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	2.9	UX
50-29-3	4,4'-DDT	14	UX
72-43-5	Methoxychlor	5.5	UX
53494-70-5	Endrin Aldehyde	8.4	UX
57-74-9	Tech. Chlordane	17	U
8001-35-2	Toxaphene	67	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	69	**
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	330	

X: Elevated detection limit due to PCB interference.
 **: Reported from a straight run on 08-14-97.
 U: Concentration of analyte is less than the value given.

FORM I PEST

1/87 Rev.

per
11/25/98

000033

000014

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOK0F7

Lab Name: QUANTERRA, MO Contract: 550-234

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01811

Matrix: (soil/water) SOIL Lab Sample ID: 15452-004

Sample wt/vol: 30.3 (g/ml) G Lab File ID:

Level: (low/med) LOW Date Sampled: 07-29-97

% Moisture: not dec. 1 dec. Date Extracted: 08-01-97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	4.3	UX
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	10	UX
309-00-2	Aldrin	8.6	UX
1024-57-3	Heptachlor epoxide	3.0	UX
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	23	UX
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	4.2	UX
50-29-3	4,4'-DDT	49	UX
72-43-5	Methoxychlor	10	UX
53494-70-5	Endrin Aldehyde	14	UX
57-74-9	Tech. Chlordane	17	U
8001-35-2	Toxaphene	67	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	380	**
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	580	

X: Elevated detection limit due to PCB interference.
 **: Reported from a straight run on 08-14-97.
 U: Concentration of analyte is less than the value given.

FORM I PEST

1/87 Rev.

Handwritten: 11/23/98

Handwritten: 000034

000015

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA, MO Contract: 550-234 BOK0F8

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01811

Matrix: (soil/water) SOIL Lab Sample ID: 15452-005

Sample wt/vol: 30.0 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 07-29-97

% Moisture: not dec. 1 dec. _____ Date Extracted: 08-01-97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CAS NO. Compound CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	4.7	UX
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	11	UX
309-00-2	Aldrin	9.4	UX
1024-57-3	Heptachlor epoxide	3.7	UX
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	26	UX
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	4.6	UX
50-29-3	4,4'-DDT	29	UX
72-43-5	Methoxychlor	12	UX
53494-70-5	Endrin Aldehyde	15	UX
57-74-9	Tech. Chlordane	17	U
8001-35-2	Toxaphene	67	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	400	**
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	640	

X: Elevated detection limit due to PCB interference.
 **: Reported from a straight run on 08-14-97.
 U: Concentration of analyte is less than the value given.

FORM I PEST

1/87 Rev.

Handwritten: 11/25/98

Handwritten: 000035

000016

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOKOHO

Lab Name: QUANTERRA, MO Contract: 550-234

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01811

Matrix: (soil/water) SOIL Lab Sample ID: 15452-006

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 07-29-97

% Moisture: not dec. 0 dec. _____ Date Extracted: 08-01-97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
72-43-5	Methoxychlor	3.3	U
53494-70-5	Endrin Aldehyde	1.7	U
57-74-9	Tech. Chlordane	17	U
8001-35-2	Toxaphene	67	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

U: Concentration of analyte is less than the value given.

FORM I PEST

1/87 Rev.

PR
11/25/98

~~000036~~

000017

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: QUANTERRA, MO Contract: 550-234 BOKOH1

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01811

Matrix: (soil/water) SOIL Lab Sample ID: 15452-007

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 07-29-97

% Moisture: not dec. 0 dec. _____ Date Extracted: 08-01-97

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08-13-97

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO. Compound Q

319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
72-43-5	Methoxychlor	3.3	U
53494-70-5	Endrin Aldehyde	1.7	U
57-74-9	Tech. Chlordane	17	U
8001-35-2	Toxaphene	67	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

U: Concentration of analyte is less than the value given.
FORM I PEST

1/87 Rev.

Handwritten: 11/25/97

Handwritten: 000037

000018

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

August 15, 1997

Attention: Joan Kessner



Project number	:	550.234
Date Received by Lab	:	July 29, 1997
Number of Samples	:	Seven (7)
Sample Type	:	Soil
SDG Number	:	W01811
Data Deliverable	:	Summary

I. Introduction

On July 29, 1997, seven (7) soil samples were received by Quanterra, Richland and were transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client IDs:

<u>St. Louis ID</u>	<u>BHL ID</u>	<u>Richland ID</u>	<u>Matrix</u>	<u>Date of Receipt</u>
15452-001	B0K0F4	70740701	Soil	29-JUL-97
15452-002	B0K0F5	70740702	Soil	29-JUL-97
15452-003	B0K0F6	70740703	Soil	29-JUL-97
15452-004	B0K0F7	70740704	Soil	29-JUL-97
15452-005	B0K0F8	70740705	Soil	29-JUL-97
15452-006	B0K0H0	70740706	Soil	29-JUL-97
15452-007	B0K0H1	70740707	Soil	29-JUL-97

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: Pesticides and PCBs by EPA Method 8080. Lead by EPA Method 7421.

000020

Bechtel Hanford Incorporated

August 15, 1997

Project Number: 550.234

SDG: W01811

Page 2

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate were performed per the protocol for each analyte in this SDG.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank

QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Shipping and Receiving

There were no variances associated with sample receipt.

Pesticides/PCBs

The samples were determined to be near 100% solids, therefore, the moisture correction is negligible.

Some of the compounds for each sample in this sample delivery group are reported at a higher detection limit due to PCB interference. The results are flagged with an 'X' qualifier.

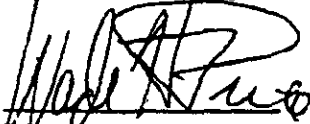
Metals

The matrix spike recovery for lead in sample 15452-001 was 77.5%, the matrix spike duplicate recovery 92.8%. In accordance with our standard operating procedure the associated lead data was flagged with an "N".

Bechtel Hanford Incorporated
August 15, 1997
Project Number: 550.234
SDG: W01811
Page 3

I certify that this Certificate of Analysis in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Wade H. Price

Project Manager

e:\price\hanford\550\20x\hanw1811.coa

000022

DATA 24

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B97-091-16

Page 1 of 1

Collector <i>Doug Bryant</i>	Company Contact Duane Jacques	Telephone No. 372-9400	Project Coordinator Koerner, CC	Date Turnaround 15 Days
Project Designation 107-D-1 Trench - Confirmation	Sampling Location 100-DR-1		SAF No. B97-091	
Ice Chest No.	Field Logbook No. <i>EC-1301</i>		Method of Shipment Hand deliver	
Shipped To Quanterra	Offsite Property No. <i>N/A</i>		Bill of Lading/Air Bill No. <i>N/A</i>	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	Cool 4C	None	None	None	Cool 4C	None			
	Type of Container	G/P	G	G	G	G	±G	<i>SP</i>			
	No. of Container(s)	1	1	1	1	1	1	1			
Special Handling and/or Storage Cool to 4C	Volume	20ml	60ml	60ml	60ml	60ml	120ml	1000ml			

0000023	SAMPLE ANALYSIS <i>707407</i>	<i>SDX</i> <i>W01811</i>	Activity Scan	Chromium Hex - 7196	Isotopic Plutonium	Lead - 7421 (GFAA)	Strontium- 89,90 - Total Sr	Pest/PCBs - 8080 (TCL)	See item (1) in Special Instructions.		
				<i>707408</i>		<i>707408</i>		<i>707408</i>			

Sample No.	Matrix *	Sample Date	Sample Time									
BOK0F4	01	Soil	7-29-97 0825	X	X	X	X	X	X	X		
BOK0F5	02	Soil	7-29-97 0840	X	X	X	X	X	X	X		
BOK0F6	03	Soil	7-29-97 0855	X	X	X	X	X	X	X		
BOK0F7	04	Soil	7-29-97 1005	X	X	X	X	X	X	X		
BOK0F8	05	Soil	7-29-97 1010	X	X	X	X	X	X	X		

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix * S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other	
Relinquished By <i>Doug Bryant</i>	Date/Time 7-29-97 1135	Received By <i>R. W. Page</i>	Date/Time 7-29-97 1135	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)				
Relinquished By	Date/Time	Received By	Date/Time					
Relinquished By	Date/Time	Received By	Date/Time					

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Collector <i>Doug Bryant</i>	Company Contact Duane Jacques	Telephone No. 372-9400	Project Coordinator Koerner, CC	Data Turnaround 15 Days							
Project Designation 107-D-1 Trench -- Confirmation	Sampling Location 100-DR-1	SAF No. B97-091									
Ice Chest No.	Field Logbook No. <i>EL-1301</i>	Method of Shipment Hand deliver									
Shipped To Quanticora	Offsite Property No. <i>N/A</i>	Bill of Lading/Air Bill No. <i>N/A</i>									
POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	Cool 4C	None	None	None	Cool 4C	None			
	Type of Container	G/P	G	G	G	G	aG	<i>SP</i> <i>2</i>			
	No. of Container(s)	1	1	1	1	1	1	1			
Special Handling and/or Storage <i>Cool to 4C</i>	Volume	20ml	60ml	60ml	60ml	60ml	120ml	1000ml			

SAMPLE ANALYSIS

10000224	Activity Scan	Chromium Hex - 7196	Isotopic Plutonium	Lead - 7421- (GFAA)	Strontium- 89.90 - Total Sr	Pest/PCBs - 8080 (TCL)	See item (1) in Special Instructions.				
		<i>707408</i>			<i>707408</i>		<i>707408</i>				

Sample No.	Matrix *	Sample Date	Sample Time										
BOKOH0 <i>06</i>	Soil	<i>7-29-97</i>	<i>0915</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>x</i>	<i>x</i>	<i>x</i>			
BOKOH1 <i>07</i>	Soil	<i>7-29-97</i>	<i>0925</i>	<i>x</i>	<i>x</i>	<i>x</i>	<i>x</i>	<i>x</i>	<i>x</i>	<i>x</i>			
BOKOH2	Soil <i>24</i>												

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By <i>Doug Bryant</i>	Date/Time <i>7-29-97</i>	Received By <i>[Signature]</i>	Date/Time <i>7-29-97 1135</i>
Relinquished By	Date/Time	Received By <i>[Signature]</i>	Date/Time <i>7-29-97 1135</i>
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155);
Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
T - Tissue
WI - Wipe
L - Liquid
V - Vegetation
X - Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE	Disposal Method	Disposed By	Date/Time

Appendix 5
Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 107 DDT + ^{107 DDT branch} RM 452			DATA PACKAGE: W01811		
VALIDATOR: TLI		LAB: QES		DATE: 11/17/98	
CASE:			SDG: W01811		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP3/90	<input checked="" type="checkbox"/> SW-846 8080	<input type="checkbox"/> SW-846 8081	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX soil ^{Soil}					
BOKOF4, BOKOF5, BOKOF6, BOKOF7, BOKOF8, BOKOF9, BOKOF10, BOKOF11					
F8 dup H0-FB H1-FB					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/AIs a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/AComments: 7/29/97

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable Yes No N/AAre calibration standard retention times acceptable? Yes No N/AAre DDT and endrin breakdowns acceptable? Yes No N/A

A5/3000026

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? Yes No **N/A**
Is the GC/MS tuning/performance check acceptable? Yes No **N/A**

Comments: _____

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and
%RSD values acceptable? Yes No **N/A**
Are quantitation column calibration factor
%RSD values acceptable? Yes No **N/A**
Were the analytical sequence requirements met? Yes No **N/A**
Are continuing calibration %D values acceptable? Yes No **N/A**

Comments: _____

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? Yes No **N/A**
Was the resolution acceptable in the resolution check mix? . . . Yes No **N/A**
Is resolution acceptable in the PEM, INDA and INDB? Yes No **N/A**
Are DDT and Endrin breakdowns acceptable? Yes No **N/A**
Are retention times in PEMs and calibration mixes acceptable? . Yes No **N/A**
Are RPD values in the PEMs acceptable? Yes No **N/A**
Are %RSD values acceptable? Yes No **N/A**

Comments: _____

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? Yes No **N/A**
Is resolution acceptable in the PEMs? Yes No **N/A**
Are initial calibrations acceptable? Yes No **N/A**

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs, INDA and INDB mixes?	Yes	No	N/A
Are RPD values in the PEMs acceptable?	Yes	No	N/A
Are the DDT and endrin breakdowns acceptable?	Yes	No	N/A
Was GPC cleanup performed?	Yes	No	N/A
Is the GPC calibration check acceptable?	Yes	No	N/A
Was Florisil cleanup performed?	Yes	No	N/A
Is the Florisil performance check acceptable?	Yes	No	N/A

Comments: _____

4. BLANKS

Were laboratory blanks analyzed?	Yes	No	N/A
Are laboratory blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments: _____

5. ACCURACY

Were surrogates analyzed?	Yes	No	N/A
Are surrogate recoveries acceptable?	Yes	No	N/A
Were MS/MSD samples analyzed?	Yes	No	N/A
Are MS/MSD results acceptable?	Yes	No	N/A
Were LCS samples analyzed?	Yes	No	N/A
Are LCS results acceptable?	Yes	No	N/A

Comments: _____

4/4-DDT MS 147 MSD 154

Surrogate → No PCB FG-HC

A/H

000028

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? Yes No N/A
Are laboratory duplicate results acceptable? Yes No N/A
Are field duplicate RPD values acceptable? Yes No N/A
Are field split RPD values acceptable? Yes No N/A

Comments: 4,4-DPT initial declined

7. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? Yes No N/A
Are positive results resolved acceptably? Yes No N/A

Comments: _____

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? Yes No N/A
Is compound quantitation acceptable? Yes No N/A

Comments: _____

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? Yes No N/A
Are all results supported in the raw data? Yes No N/A
Do results meet the CRQLs? Yes No N/A

Comments: _____

2E
SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: QUANTERRA, MO

Contract: 550-234

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01811

	EPA SAMPLE NO.	S1 (DCB) #	S2 (TCMX) #
	=====	=====	=====
01	PBLK01	114	85
02	PSPK01	116	86
03	BOKOF4	109	86
04	BOKOF4MS	109	85
05	BOKOF4MSD	105	82
06	BOKOF5	176	81
07	BOKOF6		83
08	BOKOF7		83
09	BOKOF8		84
10	BOKOH0		85
11	BOKOH1		83
12			
13			
14			
15			
16			

S1 (DCB) = Decachlorobiphenyl
S2 (TCMX) = Tetrachlorom-m-xylene

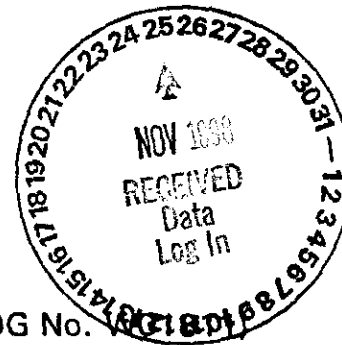
ADVISORY
QC LIMITS
(10-264)
(32-152)

Column to be used to flag recovery values

* Values outside of QC limits

D Surrogates diluted out

Date: 25 November 1998
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 107-D1 Trench - Confirmation
Subject: Radiochemistry - Data Package No. W01811-QES (SDG No. W01811-QES)



INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. W01811-QES which was prepared by Quanterra Environmental Services (QES). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOKOF4	7/29/97	Soil	C	See note 1
BOKOF5	7/29/97	Soil	C	See note 1
BOKOF6	7/29/97	Soil	C	See note 1
BOKOF7	7/29/97	Soil	C	See note 1
BOKOF8	7/29/97	Soil	C	See note 1
BOKOH0	7/29/97	Soil	C	See note 1
BOKOH1	7/29/97	Soil	C	See note 1

1 - Gamma spectroscopy; isotopic plutonium; strontium-90.

Data validation was conducted in accordance with the BHI validation statement of work (BHI 1997) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL 1998). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

000001

DATA QUALITY OBJECTIVES

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are elevated to the MDA and qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

Due to positive laboratory blank detection, radium-224 and radium-226 results in all samples were qualified as estimates and flagged "J".

All other blank results were acceptable.

Field and Equipment Blanks

One equipment blank (BOKOH1) and one field blank (BOKOH0) were submitted for analysis. Potassium-40, radium-224, radium-226, and radium-228 were detected in the field blank. Potassium-40, cobalt-60, radium-224, radium-226, and radium-228 were detected in the equipment blank. Under the BHI statement of work, no qualification was required. No other analytes were detected in the field or equipment blank.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is 3 sigma. In addition, samples may be spiked with a radiochemical tracer to assist in

isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS analysis, all plutonium-238 and americium-241 results were qualified as estimates and flagged "J".

Due to an LCS recovery of 147%, all detected uranium-238 (GEA) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than or equal to 30 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOKOF7/BOKOF8) were submitted to QES for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported laboratory detection levels are reviewed to ensure that they are at or below the limits listed in page II-5 of the 100 Area Remedial Action Sampling and Analysis Plan. All reported MDAs were at or below the analyte-specific limits.

- **Completeness**

Data Package No. W01811-QES was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to positive laboratory blank detection, radium-224 and radium-226 results in all samples were qualified as estimates and flagged "J". Due to the lack of an LCS analysis, all plutonium-238 and americium-241 results were qualified as estimates and flagged "J". Due to an LCS recovery of 147%, all detected uranium-238 (GEA) results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

Appendix 2
Summary of Data Qualification

000007

DATA QUALIFICATION SUMMARY

SDG: W01811	REVIEWER: TLI	DATE: 11/25/98	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Plutonium-238 and Americium-241	J	All	No LCS analysis
Radium-224 and Radium-226	J	All	Blank contamination
Uranium-238	J	BOKOF4, BOKOF5, BOKOF6, BOKOF7, BOKOF8	LCS percent recovery

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

0000010

NA = NOT ANALYZED

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740801 MATRIX: SOIL
CLIENT ID: B0K0F4 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7196
PU-238	6.21E-03	1.6E-02	1.7E-02	4.07E-02	pCi/g	37.40%	RICHRC5010 J
PU239/40	7.51E-03	1.6E-02	1.6E-02	3.28E-02	pCi/g	37.40%	RICHRC5010 J
AM-241	3.20E-02	3.4E-02	3.4E-02	5.63E-02	pCi/g	N/A	RICHRC5017 J
CO-60	1.94E-02	8.3E-03	8.5E-03	1.63E-02	pCi/g	N/A	RICHRC5017
CS-137DA	4.79E-02	2.0E-02	2.1E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	5.21E-02	2.2E-02	2.3E-02	3.89E-02	pCi/g	N/A	RICHRC5017
EU-154	1.27E-03	2.8E-02	2.8E-02	4.83E-02	pCi/g	N/A	RICHRC5017
EU-155	1.92E-02	2.6E-02	2.6E-02	4.08E-02	pCi/g	N/A	RICHRC5017
K-40	1.02E+01	4.0E-01	1.1E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.25E-01	2.5E-02	5.8E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	4.06E-01	3.2E-02	5.2E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	5.02E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.63E-01	2.9E-01	3.0E-01	4.92E-01	pCi/g	N/A	RICHRC5017 J
STRONTIUM	7.22E-02	3.7E-02	4.6E-02	1.13E-01	pCi/g	92.20%	RICHRC5006

Number of Results: 15

Handwritten signature
11/25/95

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740802 MATRIX: SOIL
CLIENT ID: BOK0F5 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7150
PU-238	5.77E-03	1.7E-02	1.7E-02	4.53E-02	pCi/g	37.40%	RICHRC5010 J
PU239/40	2.48E-02	2.9E-02	3.0E-02	3.41E-02	pCi/g	37.40%	RICHRC5010
AM-241	-1.48E-02	3.2E-02	3.2E-02	5.15E-02	pCi/g	N/A	RICHRC5017 J
CO-60	6.21E-03	9.6E-03	9.6E-03	1.70E-02	pCi/g	N/A	RICHRC5017
CS-137DA	9.25E-03	8.4E-03	8.5E-03	1.47E-02	pCi/g	N/A	RICHRC5017
EU-152	1.61E-02	2.0E-02	2.0E-02	3.49E-02	pCi/g	N/A	RICHRC5017
EU-154	-8.57E-03	3.1E-02	3.1E-02	5.07E-02	pCi/g	N/A	RICHRC5017
EU-155	3.90E-02	2.5E-02	2.6E-02	4.12E-02	pCi/g	N/A	RICHRC5017
K-40	1.13E+01	4.4E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	6.21E-01	2.8E-02	6.8E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	4.78E-01	3.7E-02	6.0E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	6.57E-01	6.8E-02	9.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	1.74E-01	3.4E-01	3.4E-01	N/A	pCi/g	N/A	RICHRC5017 J
STRONTIUM	4.79E-02	3.5E-02	3.9E-02	1.17E-01	pCi/g	90.90%	RICHRC5006

Number of Results: 15

pu
11/25/98

00007K

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740803 MATRIX: SOIL
CLIENT ID: BOK0F6 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA714
PU-238	-7.76E-04	1.6E-03	1.6E-03	3.90E-02	pCi/g	43.40%	RICHRC5010 J
PU239/40	6.60E-03	2.0E-02	2.0E-02	5.18E-02	pCi/g	43.40%	RICHRC5010
AM-241	3.89E-03	4.6E-02	4.7E-02	7.75E-02	pCi/g	N/A	RICHRC5017 J
CO-60	-2.23E-03	8.8E-03	8.8E-03	1.46E-02	pCi/g	N/A	RICHRC5017
CS-137DA	2.90E-02	1.2E-02	1.2E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	4.58E-02	2.0E-02	2.0E-02	3.56E-02	pCi/g	N/A	RICHRC5017
EU-154	2.21E-02	2.5E-02	2.5E-02	4.48E-02	pCi/g	N/A	RICHRC5017
EU-155	3.10E-02	2.3E-02	2.4E-02	3.90E-02	pCi/g	N/A	RICHRC5017
K-40	9.34E+00	3.7E-01	1.0E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	4.77E-01	2.3E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	3.91E-01	3.2E-02	5.1E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	5.06E-01	6.3E-02	8.1E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	5.23E-01	5.1E-01	5.1E-01	N/A	pCi/g	N/A	RICHRC5017 J
STRONTIUM	4.63E-02	3.6E-02	3.9E-02	1.20E-01	pCi/g	84.40%	RICHRC5006

Number of Results: 15

me
11/23/98

000008

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740804 MATRIX: SOIL
CLIENT ID: B0K0F7 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7195
PU-238	-9.05E-04	1.8E-03	1.8E-03	4.55E-02	pCi/g	35.50%	RICHRC5010 J
PU239/40	3.21E-02	3.9E-02	4.0E-02	5.16E-02	pCi/g	35.50%	RICHRC5010
AM-241	5.90E-02	3.4E-02	3.4E-02	5.58E-02	pCi/g	N/A	RICHRC5017 J
CO-60	3.34E-02	1.1E-02	1.1E-02	2.17E-02	pCi/g	N/A	RICHRC5017
CS-137DA	2.01E-01	1.8E-02	2.7E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	3.74E-01	4.5E-02	5.9E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	4.51E-02	3.2E-02	3.2E-02	5.67E-02	pCi/g	N/A	RICHRC5017
EU-155	3.96E-02	2.7E-02	2.8E-02	4.42E-02	pCi/g	N/A	RICHRC5017
K-40	1.07E+01	4.2E-01	1.2E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.57E-01	2.9E-02	6.3E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	4.65E-01	3.9E-02	6.1E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	5.71E-01	7.5E-02	9.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	8.40E-01	4.1E-01	4.2E-01	N/A	pCi/g	N/A	RICHRC5017 J
STRONTIUM	2.37E-01	5.9E-02	1.0E-01	1.41E-01	pCi/g	90.10%	RICHRC5006

Number of Results: 15

Handwritten: 11/25/98

Handwritten: 000003

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740805 MATRIX: SOIL
CLIENT ID: BOK0F8 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7146
PU-238	-1.22E-03	1.7E-03	1.7E-03	3.48E-02	pCi/g	40.80%	RICHRC5010 J
PU239/40	3.51E-02	3.4E-02	3.5E-02	4.31E-02	pCi/g	40.80%	RICHRC5010
AM-241	5.40E-03	3.6E-02	3.6E-02	5.66E-02	pCi/g	N/A	RICHRC5017 J
CO-60	3.02E-02	1.1E-02	1.1E-02	2.10E-02	pCi/g	N/A	RICHRC5017
CS-137DA	1.74E-01	1.6E-02	2.4E-02	N/A	pCi/g	N/A	RICHRC5017
EU-152	3.32E-01	4.2E-02	5.4E-02	N/A	pCi/g	N/A	RICHRC5017
EU-154	7.62E-03	3.1E-02	3.1E-02	5.28E-02	pCi/g	N/A	RICHRC5017
EU-155	3.18E-02	2.5E-02	2.5E-02	4.17E-02	pCi/g	N/A	RICHRC5017
K-40	9.80E+00	3.9E-01	1.1E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	5.11E-01	2.6E-02	5.7E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	3.98E-01	3.6E-02	5.3E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	5.15E-01	7.1E-02	8.8E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	6.26E-01	3.0E-01	3.1E-01	4.99E-01	pCi/g	N/A	RICHRC5017 J
STRONTIUM	3.04E-01	6.1E-02	1.2E-01	1.15E-01	pCi/g	93.70%	RICHRC5006

Number of Results: 15

Handwritten signature
10/25/98

Handwritten number
00016

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740806 MATRIX: SOIL
CLIENT ID: BOKOH0 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.00E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA 7166
PU-238	0.00E+00	0.0E+00	3.2E-02	2.88E-02	pCi/g	28.00%	RICHRC5010 J
PU239/40	-8.51E-04	1.7E-03	1.7E-03	4.28E-02	pCi/g	28.00%	RICHRC5010
AM-241	-1.38E-02	2.9E-02	2.9E-02	4.54E-02	pCi/g	N/A	RICHRC5017 J
CO-60	9.53E-03	8.0E-03	8.1E-03	1.50E-02	pCi/g	N/A	RICHRC5017
CS-137DA	4.61E-03	6.6E-03	6.6E-03	1.11E-02	pCi/g	N/A	RICHRC5017
EU-152	8.22E-03	1.7E-02	1.7E-02	2.86E-02	pCi/g	N/A	RICHRC5017
EU-154	-1.25E-03	3.3E-02	3.3E-02	5.51E-02	pCi/g	N/A	RICHRC5017
EU-155	2.38E-02	1.9E-02	1.9E-02	3.30E-02	pCi/g	N/A	RICHRC5017
K-40	1.61E+01	4.7E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	2.26E-01	1.8E-02	2.9E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	1.98E-01	3.0E-02	3.6E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	2.03E-01	5.2E-02	5.5E-02	N/A	pCi/g	N/A	RICHRC5017
U-238	1.14E-01	2.5E-01	2.5E-01	4.00E-01	pCi/g	N/A	RICHRC5017 J
STRONTIUM	2.66E-02	3.1E-02	3.2E-02	1.15E-01	pCi/g	90.10%	RICHRC5006

Number of Results: 15

RR
11/25/98

00014

SAMPLE RESULTS

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: 70740807 MATRIX: SOIL
CLIENT ID: BOK0H1 DATE RECEIVED: 7/29/1997 11:35:00 AM

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
HEXCHROME	3.88E-02	N/A	N/A	3.00E-02	mg/kg	N/A	EPA7115
PU-238	3.47E-03	9.2E-03	9.2E-03	2.28E-02	pCi/g	66.90%	RICHRC5010 J
PU239/40	-3.65E-04	7.3E-04	7.3E-04	1.84E-02	pCi/g	66.90%	RICHRC5010
AM-241	2.70E-03	3.4E-02	3.4E-02	5.43E-02	pCi/g	N/A	RICHRC5017 J
CO-60	1.89E-02	8.5E-03	8.7E-03	1.64E-02	pCi/g	N/A	RICHRC5017
CS-137DA	-2.14E-03	6.6E-03	6.6E-03	1.11E-02	pCi/g	N/A	RICHRC5017
EU-152	1.18E-02	1.7E-02	1.7E-02	2.93E-02	pCi/g	N/A	RICHRC5017
EU-154	-4.45E-02	3.2E-02	3.3E-02	5.06E-02	pCi/g	N/A	RICHRC5017
EU-155	-3.43E-03	2.1E-02	2.1E-02	3.33E-02	pCi/g	N/A	RICHRC5017
K-40	1.63E+01	4.6E-01	1.7E+00	N/A	pCi/g	N/A	RICHRC5017
RA-224DA	2.08E-01	2.4E-02	3.2E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-226DA	2.03E-01	2.8E-02	3.5E-02	N/A	pCi/g	N/A	RICHRC5017 J
RA-228DA	2.45E-01	4.0E-02	4.7E-02	7.99E-02	pCi/g	N/A	RICHRC5017
U-238	1.90E-01	2.7E-01	2.7E-01	4.46E-01	pCi/g	N/A	RICHRC5017 J
STRONTIUM	1.57E-02	3.4E-02	3.5E-02	1.37E-01	pCi/g	94.20%	RICHRC5006

Number of Results: 15

John
11/25/98

000127

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

August 20, 1997

Attention: Joan Kessner

SAF Number : B97-091
Date SDG Closed : July 29, 1997
Number of Samples : Seven (7)
Sample Type : Soil
SDG Number : W01811
Data Deliverable : Summary



I. Introduction

On July 29, 1997, seven soil samples were received by the Quanterra Environmental Services Richland Laboratory (QESRL) for radiochemical and chemical analysis. Upon receipt, the samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

<u>QESRL ID#</u>	<u>BHI ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
70740801	B0K0F4	Soil	7/29/97
70740802	B0K0F5	Soil	7/29/97
70740803	B0K0F6	Soil	7/29/97
70740804	B0K0F7	Soil	7/29/97
70740805	B0K0F8	Soil	7/29/97
70740806	B0K0H0	Soil	7/29/97
70740807	B0K0H1	Soil	7/29/97

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

000019

~~00002~~

Bechtel Hanford, Inc.
August 20, 1997
Page 2

The requested analyses were:

- Alpha Spectroscopy**
Plutonium-238, -239/40 by method RICH-RC-5010
- Gamma Spectroscopy**
Gamma Scan by method RICH-RC-5017
- Gas Proportional Counting**
Total Strontium by method RICH-RC-5006
- Chemical Analyses**
Chromium Hex by EPA method 7196

III. Quality Control

The analytical results for each analysis performed under SDG W01811 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results with the exception of the chemical analyses which are reported in mg/L.

IV. Comments

Alpha Spectroscopy

Plutonium-238, -239/40 by method RICH-RC-5010

Due to an oversight samples from SDGs W01809 and W01811 were batched together. The LCS, batch blank, sample and sample duplicate (B0K0N4) results are within contractual requirements.

Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

The LCS, batch blank, sample and sample duplicate (B0K0F4) results are within contractual requirements.

000020

~~00003~~

Bechtel Hanford, Inc.
August 20, 1997
Page 3

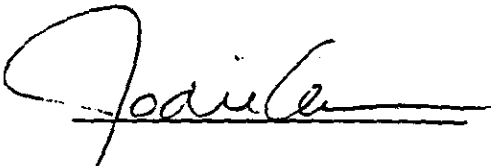
Chemical Analysis

Chromium Hex by EPA method 7196

The original analysis of the samples was performed within the holding time. However, due to problems with the blank, the sample were reanalyzed outside holding time as per client direction. The matrix spike and matrix spike duplicate recoveries were low due to sample matrix interference. A post digestive spike was analyzed and its low recovery confirms the reducing effect of the sample. The LCS, batch blank, sample results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:



Jodie Carnes
Project Manager

000021

~~00004~~

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B97-091-17

Page 1 of

Collector Doug Bryant	Company Contact Duane Jacques	Telephone No. 372-9400	Project Coordinator Koerner, CC	Date Turnaround 15 Days
Project Designation 107-D-1 Trench - Confirmation	Sampling Location 100-DR-1		SAF No. B97-091	
Ice Chest No.	Field Logbook No. EL-1301		Method of Shipment Hand deliver	
Shipped To Quarters	Offsite Property No. N/A		BIL of Lading/Air Bill No. N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
Cool to 4C

SAMPLE ANALYSIS

707407

Activity Series

Chromium
Hex - 7194Isotope
PlutoniumLead - 7421-
(232AA)Strontium-
89.90 - Total
inFast FCMs -
8086 (TCL)See Item (1) in
Special
Instructions.**707408****707408****707408**

Sample No.	Matrix *	Sample Date	Sample Time										
BOKOH0 06	Soil	7-29-97	0915	L	L	X	X	X	X	X	X		
BOKOH1 07	Soil	7-29-97	0925	X	X	X	(X)	X	(X)	X			
BOKOH2	Soil 08						(100)		(100)				

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By Doug Bryant	Date/Time 7-29-97 1135	Received By [Signature]	Date/Time 7-29-97 1135
Relinquished By [Signature]	Date/Time	Received By [Signature]	Date/Time <1004
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155);
Gamma Spec - Add-on (Americium-241, Uranium-238)

Matrix *

- S - Soil
- SS - Sediment
- SD - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Dry Solid
- DL - Dry Liquid
- T - Tissue
- WI - Wipe
- L - Liquid
- V - Vegetation
- X - Other

LABORATORY
SECTION

Received By

Title

Date/Time

STANDARD METHOD

Standard Rev

Collector Doug Bryant		Company Contact Diane Jacques		Telephone No. 372-9400		Project Coordinator Koerner, CC		Data Turnaround 15 Days					
Project Designation 107-D-1 Trench - Confirmation		Sampling Location 100-DR-1				SAF No. B97-091							
Ice Chest No.		Field Logbook No. EL-1301				Method of Shipment Hand deliver							
Shipped To Quarters		Offsite Property No. N/A				Bill of Lading/Air Bill No. N/A							
POSSIBLE SAMPLE HAZARDS/REMARKS		Preservation	None	Cool 4C	None	None	None	Cool 4C	None				
		Type of Container	OP	O	O	O	O	O	SP as				
		No. of Container(s)	1	1	1	1	1	1	1				
Special Handling and/or Storage Cool to 4C		Volume	20ml	60ml	60ml	60ml	60ml	120ml	1000ml				
SAMPLE ANALYSIS 107407 SDX W01811		Activity Scan	Chromium Hex - 7196	Isotopic Plutonium	Lead - 7421 (CPAA)	Selenium 89.90 - Total S	Pol/PCBs - 8080 (TCL)	See Item (1) in Special Instructions					
			107408			107408		107408					
0000023	Sample No.	Matrix *	Sample Date	Sample Time									
	30K0F4	01	Soil	7-29-97	0825	X	X	X	X	X	X		
	30K0F5	02	Soil	7-29-97	0840	X	X	X	X	X	X		
	30K0F6	03	Soil	7-29-97	0855	X	X	X	X	X	X		
	30K0F7	04	Soil	7-29-97	1005	X	X	X	X	X	X		
	30K0F8	05	Soil	7-29-97	1010	X	X	X	X	X	X		
CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS						Matrix *	
Relinquished By Doug Bryant		Date/Time 7-29-97 1135		Received By R. W. J. Jr.		Date/Time 7-29-97 1135		(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)				S	- Soil
Relinquished By [Signature]		Date/Time		Received By [Signature]		Date/Time						SE	- Sediment
Relinquished By [Signature]		Date/Time		Received By		Date/Time						SL	- Solid
Relinquished By [Signature]		Date/Time		Received By		Date/Time						W	- Water
Relinquished By [Signature]		Date/Time		Received By		Date/Time						O	- Oil
Relinquished By [Signature]		Date/Time		Received By		Date/Time						A	- Air
Relinquished By [Signature]		Date/Time		Received By		Date/Time						DE	- Dredge Solids
Relinquished By [Signature]		Date/Time		Received By		Date/Time						DL	- Dredge Liquids
Relinquished By [Signature]		Date/Time		Received By		Date/Time						T	- Tissue
Relinquished By [Signature]		Date/Time		Received By		Date/Time						W/L	- Wipe
Relinquished By [Signature]		Date/Time		Received By		Date/Time						L	- Liquid
Relinquished By [Signature]		Date/Time		Received By		Date/Time						V	- Vegetation
Relinquished By [Signature]		Date/Time		Received By		Date/Time						X	- Other
LABORATORY SECTION		Received By		Title		Date/Time							

Appendix 5
Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT:			DATA PACKAGE: W01811		
VALIDATOR:	LAB: QES		DATE: 11/16/98		
CASE:			SDG: W01811		
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX Soil					
BOKOF4, BOKOF5, BOKOF6, BOKOF7, BOKOF8					
BOKOHO, BOKONI					

1. Completeness ~~Yes~~ N/A

Technical verification forms present? Yes No N/A

Comments: _____

2. Initial Calibration ~~Yes~~ N/AInstruments/detectors calibrated within
one year of sample analysis? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Comments: _____

3. Continuing Calibration ☒ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards NIST traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Comments: _____

4. Blanks ☐ N/A

Method blank analyzed? ☒ Yes No N/A

Method blank results acceptable? Yes ☒ No N/A

Analytes detected in method blank? ☒ Yes No N/A

Field blank(s) analyzed? ☒ Yes No N/A

Field blank results acceptable? Yes ☒ No N/A

Analytes detected in field blank(s)? ☒ Yes No N/A

Transcription/Calculation Errors? Yes No ☒ N/A

Comments: K-40, RA-224/224 (MB)

~~CO-60~~

K-40, RA-224/226/228 H0

CO-60, " " " K-40

5. Matrix Spikes ☐ N/A

Matrix spike analyzed? Yes No ☒ N/A

Spike recoveries acceptable? Yes No ☒ N/A

Spike source traceable? Yes No ☒ N/A

Spike source expired? Yes No ☒ N/A

Transcription/Calculation Errors? Yes No ☒ N/A

Comments: _____

A-202

6. Laboratory Control Samples ☐ N/A

LCS analyzed? ☒ Yes No ☐ N/A

LCS recoveries acceptable? Yes ☒ No ☐ N/A

LCS traceable? Yes No ☒ N/A

Transcription/Calculation Errors? Yes No ☒ N/A

Comments: U-238 -14790
No Am-241 or Pu-238

7. Chemical Recovery ☐ N/A

Chemical carrier added? ☒ Yes No ☐ N/A

Chemical recovery acceptable? ☒ Yes No ☐ N/A

Chemical carrier traceable? Yes No ☒ N/A

Chemical carrier expired? Yes No ☒ N/A

Transcription/Calculation errors? Yes No ☒ N/A

Comments: _____

8. Duplicates ☐ N/A

Duplicates Analyzed? ☒ Yes No ☐ N/A

RPD Values Acceptable? ☒ Yes No ☐ N/A

Transcription/Calculation Errors? Yes No ☒ N/A

Comments: U-238 (Geo) 64% (w/in +/- 40%)

~~150~~

9. Field QC Samples ☐ N/A

Field duplicate sample(s) analyzed? ☒ Yes No N/A

Field duplicate RPD values acceptable? ☒ Yes No N/A

Field split sample(s) analyzed? Yes ☒ No N/A

Field split RPD values acceptable? Yes No ☒ N/A

Performance audit sample(s) analyzed? Yes No ☒ N/A

Performance audit sample results acceptable? Yes No ☒ N/A

Comments: _____

10. Holding Times

Are sample holding times acceptable? ☒ Yes No N/A

Comments: _____

11. Results and Detection Limits (Levels D & E) ☐ N/A

Results reported for all required sample analyses? ☒ Yes No N/A

Results supported in raw data? Yes No ☒ N/A

Results Acceptable? Yes No ☒ N/A

Transcription/Calculation errors? Yes No ☒ N/A

MDA's meet required detection limits? ☒ Yes No ☒ N/A

Transcription/calculation errors? Yes No ☒ N/A

Comments: _____

~~A-4~~

000028

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland SDG: /RPT GRP: W01811 / 3274
LAB SAMPLE ID: T074081M MATRIX: SOIL

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
CS-137DA	3.31E-01	3.6E-02	4.9E-02	N/A	pCi/g	N/A	3.48E-01	95.00%
K-40	1.90E+01	7.6E-01	2.0E+00	N/A	pCi/g	N/A	1.95E+01	97.03%
RA-226DA	9.67E-01	7.5E-02	1.2E-01	N/A	pCi/g	N/A	1.15E+00	83.82%
RA-228DA	2.10E+00	1.5E-01	2.6E-01	N/A	pCi/g	N/A	1.87E+00	112.12%
U-238	1.55E+00	8.4E-01	8.5E-01	1.39E+00	pCi/g	N/A	1.05E+00	147.71%

Number of Results:

000029

~~00019~~

BLANK RESULTS

LAB NAME: QUANTERRA, Richland SDG /RPT GRP: W01811 / 3274
LAB SAMPLE ID: T074081X MATRIX: SOIL

ANALYTE	RESULT	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	1.14E-02	1.8E-02	1.8E-02	3.08E-02	pCi/g	N/A	RICHRC5017
CO-60	5.96E-03	2.6E-03	2.7E-03	6.82E-03	pCi/g	N/A	RICHRC5017
CS-137DA	-1.22E-03	4.0E-03	4.0E-03	6.80E-03	pCi/g	N/A	RICHRC5017
EU-152	1.34E-02	1.0E-02	1.0E-02	1.92E-02	pCi/g	N/A	RICHRC5017
EU-154	-7.69E-03	1.2E-02	1.2E-02	1.99E-02	pCi/g	N/A	RICHRC5017
EU-155	4.41E-03	1.0E-02	1.0E-02	1.75E-02	pCi/g	N/A	RICHRC5017
K-40	2.59E-01	6.7E-02	7.2E-02	1.50E-01	pCi/g	N/A	RICHRC5017
RA-224DA	4.64E-02	1.0E-02	1.1E-02	N/A	pCi/g	N/A	RICHRC5017
RA-226DA	7.25E-02	1.4E-02	1.6E-02	N/A	pCi/g	N/A	RICHRC5017
RA-228DA	3.46E-02	1.8E-02	1.8E-02	3.46E-02	pCi/g	N/A	RICHRC5017
U-238	9.07E-02	1.7E-01	1.7E-01	2.84E-01	pCi/g	N/A	RICHRC5017

Number of Results: 11

000030

00017

Review Comment Record (RCR)	1. Date 12/14/98	2. Review No. BHI/QA98016
	3. Project 107-D1	4. Page Page 1 of 1

5. Document Number(s)/Title(s) WO1811-QES (SDG No. WO1811)	6. Program/Project/ Building Number 107 D1 Trench Confirmation	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
-------------------------------------------------------------------	-------------------------------------------------------------------------	----------------------------------	-------------------------------------	-----------------------------------------

17. Comment Submittal Approval: _____ Organization Manager (Optional)	10. Agreement with indicated comment disposition(s) _____ Date	11. CLOSED _____ Date	_____ Reviewer/Point of Contact
---------------------------------------------------------------------------------	--------------------------------------------------------------------------	---------------------------------	------------------------------------

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Radchem: Page 010, Sample BOK0H0, Uranium-238 (GEA) shows value as 1.14; whereas, laboratory data sheet (page 016) has the value as 1.14E-01 (0.114).		corrected R/R	
2	Pesticide/PCB and Inorganics – No Comments			

P. 2/2

BHI Sample Management

Fax

Re: [\[Redacted\]](#) **CC:** [\[Redacted\]](#)

● **Comments:**

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

BHI S&D MANAGEMENT 509 372 9487

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
017	MEMORY TX		3755151	02/02	OK

ERRORS

1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

Attn: BHI Sample Management
3180 George Washington Way
MSIN: HB-03
Phone: 375-9439
FAX: 372-9487

**BHI Sample
Management**

Fax

To: Bruce Christian From: Jeanette Duncan
Fax: 375-5151 Pages: _____
Phone: _____ Date: _____
Re: _____ CC: _____

Duncan, Jeanette M

From: Blumenkranz, David B
Sent: Wednesday, December 09, 1998 10:03 AM
To: Duncan, Jeanette M
Cc: Sturges, Mark H; Fancher, Jonathan D (Jon)
Subject: Data Validation Package for Radiochemistry W01811-QES

Jeanette,

Hear are my comments on the Data Validation Package for Radiochemistry W01811-QES:

Precision, p. 3, Sentences 3 through 6: use the words "(acceptable RPD)" after "control limit" or else the sentences don't seem to make much sense to the non-validator.

Other than that, it looks good.

Thanks,
Dave

Duncan, Jeanette M

From: Blumenkranz, David B
Sent: Monday, December 07, 1998 8:24 AM
To: Duncan, Jeanette M
Cc: Sturges, Mark H; Fancher, Jonathan D (Jon)
Subject: 107-D1 Data Validation Packages

Jeanette,

My comments on the 107-D1 Data Validation Packages are as follows:

Pest/PCB Data Package W01811-QES:

Analytical Detection Levels description, indicate that CRDLs and TDLs were met (this is because the CRDLs and TDL are not necessarily the same, the validator should look at both criteria).

Inorganics Data Package W01811-QES:

Holding Time description, 1st sentence, indicate that lead and Cr⁺⁶ were evaluated.

Analytical Detection Levels description, indicate that CRDLs and TDLs were met (this is because the CRDLs and TDL are not necessarily the same, the validator should look at both criteria).

Let the validator know that the inclusion of the field & equipment blanks (both had detectable lead) in the *Minor Deficiencies* summary was helpful. Even though no data qualification was required, the problems with the field & equipment blank were worth noting.

Thanks,
Dave